

PATENT ABSTRACTS OF JAPAN

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(54) AGED FLAVOR IMPROVER FOR UNHEATED EDIBLE MEAT PRODUCT AND METHOD FOR IMPROVING AGED FLAVOR OF UNHEATED EDIBLE MEAT PRODUCT

(57)Abstract:

PURPOSE: To obtain an unheaded edible meat product excellent in aged flavor by adding an aged flavor improver composed of a fermented milk (powder) regulated with bifidus bacteria to a raw material meat and aging the resultant meat without heating.

CONSTITUTION: A raw ham rich in aged flavor is obtained in a short period by adding a fermented milk or powder thereof regulated with bifidus bacteria (preferably Bifidobacterium longum, etc) into, e.g. a pickling agent, rubbing the resultant pickling agent into roast pork, curing the pork, soaking the cured pork, drying the soaked pork and subjecting the dried pork to smoking treatment.

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Specification

1. Name of Invention

Aged flavour improver for unheated edible meat products and method for improving the aged flavour thereof.

2. Scope of Claim

1. An aged flavour improver for unheated edible meat products whose effective ingredient is fermented milk, or powder thereof, regulated with bifidus bacteria.
2. An aged flavour improver for unheated edible meat products according to Claim 1, whereby the bifidus bacteria in the fermented milk, or powder thereof, is made up of one, or more than two of, the following: *Bifidobacterium longum*, *Bifidobacterium bifidum*, *Bifidobacterium adolescentis*, *Bifidobacterium infantis* and/or *Bifidobacterium breve*.
3. A method for improving the aged flavour of unheated edible meat products, characterised by adding fermented milk, or powder thereof, regulated with bifidus bacteria.
4. A method for improving the aged flavour of unheated edible meat products according to Claim 3, whereby the bifidus bacteria in the fermented milk, or powder thereof, to be added is made up of one, or more than two of, the following: *Bifidobacterium longum*, *Bifidobacterium bifidum*, *Bifidobacterium adolescentis*, *Bifidobacterium infantis* and/or *Bifidobacterium breve*.
5. A method for improving the aged flavour of unheated edible meat products according to Claim 3, whereby the proportion of fermented milk added to the raw meat is 5.0-20.0 wt.%, and the proportion of fermented milk powder added thereto is 0.5-4.0 wt.%.

3. Detailed Description of the Invention

[Industrial Field of Application]

This invention concerns an aged flavour improver for unheated edible meat products and a method for improving the aged flavour thereof.

[Conventional Technology]

Various attempts have been made in order to improve the flavour of unheated edible meat products. For example, the following methods are known: the addition of a lactic acid bacteria starter (published unexamined patent application 56-18570, published examined patent application 63-35224, published examined patent application 63-49987, published unexamined patent application 63-156380), and the addition of sodium lactate or a gustatory substance (published examined patent application 61-43974, published examined patent application 61-61777, published unexamined patent application 63-126470).

However, in the case of these conventional technologies, the method of using a facultative anaerobic bacteria starter such as genus *Lactobacillus* or genus *Pediococcus* employs live bacteria. As a result, the process is difficult to manage, lactic acid fermentation progresses and there is consequently a drop in the product pH, which has an adverse effect on the flavour. Therefore, the production of unheated edible meat products using conventional technology required scrupulous care with regard to the management of the lactic acid bacteria starter, and its fermenter.

[Issue to be solved by the invention]

The aged flavour of meat products comprises the complex action of water-soluble compounds, such as nucleic acid, organic acid, amino acid and peptide, in addition to aromatic ingredients.

This invention aims to offer an aged flavour improver for unheated edible meat products, and a method for improving the aged flavour thereof, by facilitating production of unheated edible meat products with an improved aged flavour by means of the simple method of adding fermented milk, or powder thereof, regulated with bifidus bacteria.

[Means to solve the issue]

This invention concerns an aged flavour improver for unheated edible meat products and a method for improving the aged flavour thereof, whereby the effective ingredient is fermented milk, or powder thereof, regulated with bifidus bacteria. Types of bifidus bacteria used in the fermented milk, or powder thereof, can include bacteria with a human source found in standard food products (mainly dairy products), such as *Bifidobacterium longum*, *Bifidobacterium bifidum*, *Bifidobacterium adolescentis*, *Bifidobacterium infantis* and *Bifidobacterium breve*. Since each of these bifidus bacteria are obligate anaerobes, even if the fermented milk, or powder thereof, is added to processed cattle meat, the bacteria do not breed and there is no consequent production of acid. Furthermore, when a small quantity of the fermented milk is added to processed meat products, proliferation of low-temperature Gram-negative bacteria within the meat can also be controlled, in view of which it is clear that lactic acid bacteria may easily proliferate (Mori Hiroaki and others, published unexamined patent application 63-14656, Kaneko Tsutomu and others, monthly journal 'Food Chemical' No. 10, p98 (1989)).

The method of preparation of the fermented milk, or powder thereof, is illustrated thus: first, skimmed milk reduction medium comprising 10-20% solid non-fat content (SNF) is inoculated with 1-2% bifidus bacteria starter (*Bifidobacterium longum*). Next, using 5-10% K_2CO_3 or NaOH as the neutraliser, the pH is controlled to 5.8-6.2, and whilst carrying out gaseous phase displacement of the carbonate, anaerobic culturing is undertaken for 16-24 hours until almost all of the lactose medium is consumed. The fermented milk is added in this state in a proportion of 5-20% to the raw meat. It is then made into a powder by means of spray drying or freeze drying, and as mentioned under Scope of Claim, is added in a proportion of 0.5-4%, this being a convenient method. In other words, the fermented milk is concentrated until its solid content reaches a consistency of 30-40%, and is then either spray dried or freeze dried using standard methods in order to make it into a powder. If the proportion of the said fermented milk is less than 5%, or of the said powder is less than 0.5%, the aged flavour effect is diminished. Additionally, the production of a rotten smell in the meat, caused by the proliferation of low-temperature Gram-negative bacteria such as genus *Pseudomonas*, genus *Flavobacterium* and genus *Enterobacter*, cannot be prevented. Moreover, if the proportion of the said fermented milk added exceeds 20%, or the proportion of the said powder exceeds 4%, the product exudes a strong and unpleasant fermented smell. In the bifidus bacteria-regulated fermented milk and powder thereof, when dissolved the pH is almost neutral, and since they contain dairy elements such as protein, there is little pungency to the flavour even if the quantity of organic acid metabolite is high.

[Examples]

This invention is described below in further detail through examples of preparation and practice, none of which serves to limit the scope of the invention.

Preparation Example 1: Preparation of bifidus bacteria fermented powder

10% skimmed milk reduction medium was inoculated with 2% Bifidobacterium longum ATCC 15707 starter. Using 8% NaOH as the neutraliser, the pH was controlled to 5.8. Whilst carrying out gaseous phase displacement of the carbonate, anaerobic culturing was undertaken at 37°C for 24 hours. It was then concentrated until the solid content reached a consistency of 35%, and a fermented milk powder was obtained through spray drying.

Practical Example 1

Raw ham was produced by means of the salt-drying method.

The composition of the pickling agent is shown in the table below.

	Reference Product	Invention
Sodium chloride	65.0%	52.6%
Seasoning / Spices	28.0%	24.1%
Sodium nitrate	7.0%	6.0%
Fermented milk powder as described in Preparation Example 1	0.0%	17.3%
TOTAL	100.0%	100.0%

After surface sterilisation of the roast pork, 5 wt.% of the pickling agent, composed as above, was rubbed into the meat and the meat cured. Since it contained a quantity of sodium used as a neutraliser in the fermented milk powder, 52.6% sodium chloride was added in order to achieve the same total amount of sodium in the meat as in the reference product. After 7 days, the same quantity of pickling agent was again rubbed into the meat. The product was cured for periods of 4 and 5 weeks, after which it was soaked, dried and subjected to smoking treatment.

The result of studying its microbiological quality is shown in Chart 1.

From Chart 1, we can understand that, in the case of this invention, the number of lactic acid bacteria in the product to which fermented milk powder was added is higher than in the reference product.

After smoking, packaging and preserving the products for examination at 5°C for periods of 7 days and 17 days, a flavour examination was carried out by a panel of 10 experts. The result is shown in Chart 2.

In both cases, the flavour score for the said product cured for a period of 5 weeks was higher than that for the reference product. Furthermore, although the flavour of the product cured for 4 weeks was inferior to that cured for 5 weeks, it achieved almost the same score as the reference product that had been cured for 5 weeks.

Preparation Example 2: Preparation of bifidus bacteria fermented milk

10% skimmed milk reduction medium was inoculated with 2% Bifidobacterium longum ATCC 15707 starter. Using 8% NaOH as the neutraliser, the pH was controlled to 5.8. Whilst carrying out gaseous phase displacement of the carbonate, anaerobic culturing was undertaken at 37°C for 24 hours, producing fermented milk.

Practical Example 2

Production of raw ham by means of the moist salting-out method

The composition of the pickling liquid is shown in the table below.

	Reference Product	Invention
Sodium chloride	20.0%	17.0%
Seasoning / Spices	6.0%	5.0%
Sodium nitrate	1.0%	1.0%
Fermented milk as described in Preparation Example 2	0.0%	77.0%
Water	73.0%	0.0%
TOTAL	100.0%	100.0%

After surface sterilisation of the roast pork, the meat was cured for 10 days in the pickling liquid, composed as above. It was then soaked, dried and subjected to smoking treatment. When measured, the quantity of fermented milk was found to be about 10% of the meat. The result of studying its microbiological quality is shown in Chart 3.

From Chart 3, we can understand that, in this invention, the number of lactic acid bacteria in the product to which fermented milk was added is higher than in the reference product. After smoking, packaging and preserving the products for examination at 5°C for periods of 7 days and 17 days, a flavour examination was carried out by a panel of 10 experts. The result is shown in Chart 4.

The flavour scores of both products presented for examination were higher than that of the reference product.

[Effect of the Invention]

According to this invention, the flavour of unheated edible meat products can be improved. In addition, the proliferation of harmful bacteria can be controlled and the curing period shortened.

4. Basic Description of the Charts

Chart 1 shows the result of examination of the microbiological quality of raw ham with fermented milk powder. Chart 2 shows the result of the flavour examination of raw ham with the fermented milk powder. Chart 3 shows the result of examination of the microbiological quality of raw ham with fermented milk. Chart 4 shows the result of the flavour examination of raw ham with the fermented milk.

Chart 1 [p460, top right]: Rise and fall of lactic acid bacteria and fungi (yeast) in the raw ham with fermented milk powder

Vertical Axis: Log (number/g)

Upper Chart: Number of Lactic Acid Bacteria

Lower Chart: Number of fungi (yeast)

Key to bars (left to right):

- Raw material meat
- After curing for 21 days
- After soaking
- After drying
- After smoking
- After 11 days, preserved at 10°C
- After 25 days, preserved at 10°C

Black bar = Reference product

Clear bar = Invention

Chart 2 [p460, bottom left]: Effect that adding fermented milk powder to raw ham has on the curing period and flavour

Vertical Axis: Flavour score

Key to bars (left to right):

- Smoked
- After packaging
- After 7 days, preserved at 5°C
- After 17 days, preserved at 5°C

Black bar = Reference product: cured for 5 weeks

Clear bar = Invention: cured for 5 weeks

Striped bar = Invention: cured for 4 weeks

Chart 3 [p460, bottom right]: Rise and fall of lactic acid bacteria and fungi (yeast) in the raw ham with fermented milk

Vertical Axis: Log (number/g)

Upper Chart: Number of Lactic Acid Bacteria

Lower Chart: Number of fungi (yeast)

Key to bars (left to right):

- Raw material meat
- After curing for 8 days
- After soaking
- After drying
- After smoking
- After 11 days, preserved at 10°C
- After 25 days, preserved at 10°C

Black bar = Reference product

Clear bar = Invention

Chart 4 [p461]: Effect that adding fermented milk to raw ham has on the curing period and flavour

Vertical Axis: Flavour score

Key to bars (left to right):

- Smoked
- After packaging
- After 7 days, preserved at 5°C
- After 17 days, preserved at 5°C

Black bar = Reference product: cured for 10 days

Clear bar = Invention: cured for 10 days